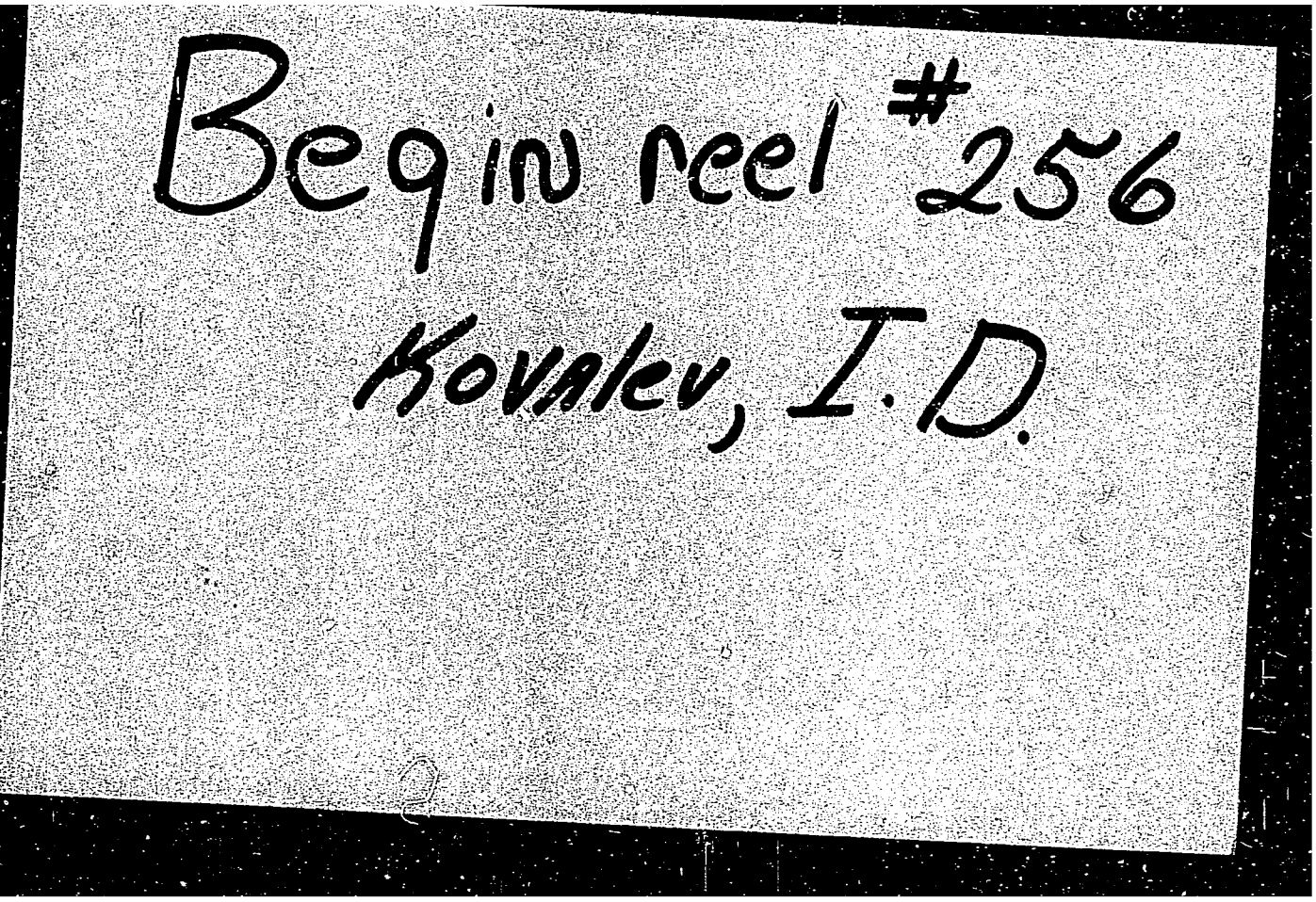


KOVALEV, Il'ya Denisovich; KORYAKIN, Yu.I., nauchnyy red.; NIKITINA, T.K., red.; POPOVA, S.M., tekhn. red.

[Small-scale nuclear engineering in the United States] Malaia atomnaia energetika v SShA. Moskva, Gosatomizdat, 1963. 29 p. (MIRA 16:6)

(United States--Atomic power plants)

SINEV, N.M. (Moskva); KOVALEV, I.D. (Moskva)

Atomic electric power plant TES-3. Priroda 54 no.2:114-117 F '65.
(MIRA 18:10)

KOVALEV, I.F.

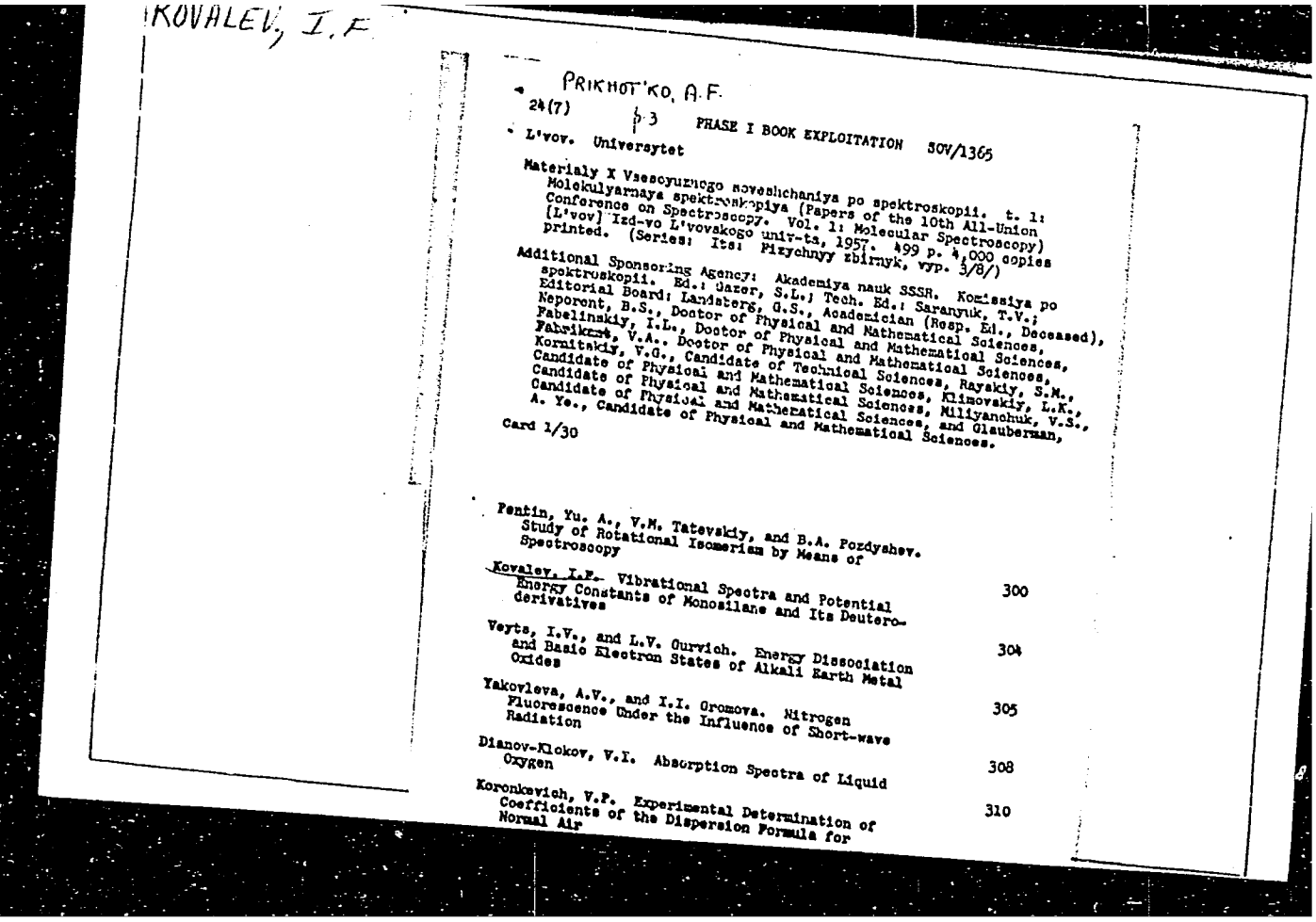
Spade for wrapping paper around a soil sample. Meteor.i gidrol. no.10:54 O '56. (MLRA 9:12)

(Soils--Analysis)

KOVALEV, I. F.

Kovalev, I. F. — "Potential Functions of Methane and Ethane." Min Higher Education USSR, Moscow Engineering-Physical Inst. Moscow, 1955 (Dissertation for the Degree of Candidate in Physicomathematical Sciences)

SO: Knizhaya Letopis', No 24, 11 June 1955, Moscow, Pages 91-104



KOVALEV, I.F.

PRIKHOT'KO, A.F.

24(7) P 3 PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizychnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Gazor, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., A. Ye., Candidate of Physical and Mathematical Sciences, and Glauberman, Candidate of Physical and Mathematical Sciences.

Card 1/30

Pentin, Yu. A., V.M. Tatevskiy, and B.A. Pozdyshev. Study of Rotational Isomerism by Means of Spectroscopy

Kovalev, I.F. Vibrational Spectra and Potential Energy Constants of Monosilane and Its Deutero-derivatives 300

Veyts, I.V., and L.V. Gurvich. Energy Dissociation and Basic Electron States of Alkali Earth Metal Oxides 304

Yakovleva, A.V., and I.I. Oromova. Nitrogen Fluorescence Under the Influence of Short-wave Radiation 305

Dianov-Klokov, V.I. Absorption Spectra of Liquid Oxygen 308

Koronkevich, V.P. Experimental Determination of Coefficients of the Dispersion Formula for Normal Air 310

AUTHOR: Kovalev, I. F.

TITLE: Vibrational spectra and potential constants of monosilane and its deuterium derivatives. (Kolebatel'nye spektry i postoyannye potentsial'noy energii monosilana i ego deyteroproizvodnykh).

51-3-5/24

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy), 1957, Vol.2, No.3, pp.310-316 (U.S.S.R.)

ABSTRACT: This theoretical paper presents calculations based on experimental values of the vibration spectra of SiH_4, SiH_2D_2, $SiHD_3$ and SiD_4. By the method of least squares the potential energy constants (the force and induction coefficients) were found for SiH_4. Also the first derivatives of frequencies with respect to the force coefficients and the frequencies and forms of the normal vibrations of monosilane and all the deuterated monosilanes were calculated. The silane molecule SiH_4 is three-dimensional and has T_d symmetry. The atomic mass of Si was taken to be 28.09 and the Si-H bond length 1.48 Å; all angles were taken to be tetrahedral and the isotopic replacement was assumed not to affect the bond lengths or angles. The experimental data were taken from C. H. Tindal, J. W. Straley, H. H. Nielsen (Phys. Rev., 62, 151, 1942) and J. Hawkins Meal, M. Kent Wilson (J. Chem.Phys.,24,385,1956)

Card 1/3

KOVALEV, I.F.

51-6-2/25

AUTHOR: Kovalev, I. F.

TITLE: Vibrational Spectra and Potential Energy Constants of Disilane and Hexadeuterodisilane. (Kolebatel'nyye spektry i postoyannyye potentsial'noy energii disilana i geksadeyterodisilana.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol. III, Nr. 6, pp. 552-559. (USSR).

ABSTRACT: Calculations of vibrational spectra of Si_2H_6 and Si_2D_6 are carried out. Potential energy constants (force constants and induction coefficients) and normal vibration forms are calculated and discussed. 11 fundamental frequencies measured in Raman and infrared spectra of Si_2H_6 (Refs.1,4,5) were used to calculate force constants listed in Table 1. The reported Si_2D_6 frequencies (Ref.5) were used to check the calculation. Interpretation of frequencies (including form of normal vibrations) is shown in Table 2. Correctness of this interpretation was checked by application of the product rule (Table 3).

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Vibrational Spectra and Potential Energy Constants of Disilane and Hexadeuterodisilane.

The problem was dealt with using the method of Vol'kenshteyn et al. (Ref.6) and Mayants (Ref.7), using an ethane-like model D_{3d} for the disilane molecule. The equilibrium lengths of bonds were taken to be 23.2 and 1.48 Å for Si-Si and Si-H respectively. It was assumed that all angles were tetrahedral. Tables 4 and 5 give the symmetrized matrices of kinematic and force constants. The force constants were calculated by repeated approximation. The initial values were determined by the method of Ref.11. The force constants of disilane (in 10^5 cm^{-2}) are given in a table at the top of p.556. These constants were used to find frequencies and forms of normal vibrations of Si_2H_6 and Si_2D_6 (Table 2). Table 6 gives the induction coefficients for Si_2H_6 and CH_4, C_2H_6, SiH_4. The author then compares the results

Card 2/3 obtained for disilane with those for ethane, and interprets

KOVALEV, I.F.

USSR/Physical Chemistry - Molecule, Chemical Bond. B-4

Abs Jour: Referat. Zhurnal Khimiya, No 3, 1958, 6925.

Author : I.F. Kovalev.
Inst : Physical Institute of Academy of Sciences of USSR.
Title : Computation and Interpretation of Vibration Spectra of Methane and Its Deuterosubstitutes.

Orig Pub: Zh. fiz. khimii, 1957, 31, vyp. 2, 362-371.

Abstract: Bibliographical and experimental data concerning Raman spectra and infrared absorption spectra of C_2H_6, C_2H_5D, C_2HD_5, and C_2D_6 served as the foundation for the computation. Referring the frequencies of these molecules to the concepts of symmetry groups, the sensitivity of these frequencies to various parameters were computed, and the influence of isotope substitutions on the frequencies was investigated by the method of L.S. Mayants (Tr. Fiz. In-ta AN SSSR, 1950, 5, 63). At the formation of secular equations, the inharmoniousness was taken into consider-

Card : 1/3 -15-

Sov/51-4-4-6/24

AUTHORS: Babushkin, A.A., Kovalev, I.F. and Yemel'yanova, V.M.

TITLE: Investigation of the Vibrational Spectra of Molecular Compounds of Boron Trifluoride with Substances Containing Nitrogen and Oxygen. I. $F_3B.NH_3$ and $F_3B.ND_3$ (Issledovaniye kolebatel'nykh spektrov molekulyarnykh soyedineniy trekhftoristogo bora s azot- i kislorod-soderzhashchimi veshchestvami. I. $F_3B.NH_3$ i $F_3B.ND_3$)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 4, pp 468-473 (USSR).

ABSTRACT: Boron trifluoride was obtained by decomposition of $C_6H_5N_2.BF_3$. Purity of boron trifluoride was checked spectrally and only SiF_4 in an amount smaller than 0.5% was found.

Molecular compounds of boron trifluoride with ammonia and deuteroammonia were obtained by condensation of ammonia (or deuteroammonia) on freezing by means of liquid nitrogen in an ether complex of boron trifluoride, $(C_2H_5)_2O.BF_3$, in a metal test tube. A white crystalline substance was obtained which was re-crystallised in water (or heavy water) or in acetone. In re-crystallisation of $F_3B.ND_3$ from acetone, a

Cardl/4

Investigation of the Vibrational Spectra of Molecular Compounds of Boron Trifluoride with Substances Containing Nitrogen and Oxygen. I. $F_3B.NH_3$ and $F_3B.ND_3$

replacement of deuterium by hydrogen occurred and a mixture of compounds with different degrees of replacement of hydrogen by deuterium was obtained. This mixture was denoted by the formula $F_3B.NH_iD_k$, where i and k may have the values 0, 1, 2, 3 and $i + k = 3$. The spectra were recorded using a spectrometer IKS-11 in the region from 2.5 to 15 μ. To avoid absorption by atmospheric water vapour and carbon dioxide, nitrogen was passed through the spectrometer. Samples were prepared by placing a layer of paste of the substance studied between two plates of rock-salt or by placing a dry layer of the substance between the same plates. Raman scattering spectrum of an aqueous solution of the molecular compound $F_3B.NH_3$ was recorded by means of a spectrograph ISP-51 with a photoelectric attachment UF-320. The infra-red absorption spectra of $F_3B.NH_3$ and $F_3B.ND_3$ are shown in Figure 1. Calculations of the force field and vibrational spectra were based on molecular models with C_{3v} symmetry for $F_3B.NH_3$ and $F_3B.ND_3$ (Figure 2)

and C_s symmetry for $F_3B.NH_2D$ and $F_3B.NHD_2$. To calculate the force constants, the authors used their own experimental results on the Raman and infra-red spectra of $F_3B.NH_3$ and $F_3B.ND_3$ (see table on p 471). The observed frequencies for the mixture denoted by $F_3B.NH_iD_k$ were used to check the calculations. The force field for $F_3B.NH_3$ was calculated by the method of Vol'kenshteyn, Yel'yashevich, Stepanov (Ref 18) and Mayants (Ref 13) using "spectroscopic masses" for hydrogen and deuterium. From 49 force constants, which determine the potential function 18 were taken to be equal to zero. The calculated force constants are given at the top of p 473. They were calculated using the BESM computer of the Ac.Sc. USSR. The table on p 471 shows that there is good agreement between the observed frequencies and those obtained by calculation using the force constants. The

 authors also calculated the coefficients of induction which

Investigation of the Vibrational Spectra of Molecular Compounds of Boron Trifluoride with Substances Containing Nitrogen and Oxygen. I. $F_3B.NH_3$ and $F_3B.ND_3$

are given in the middle of p 473. The authors thank A.I. Shatenshteyn for supply of deuterated ammonia and K.I. Podlovchenko for help in carrying out the calculations on the computer. There are 2 figures, 1 table and 19 references, 6 of which are Soviet, 8 in English, 2 German, 1 French, 1 translation of Western work into Russian and one other.

ASSOCIATION: Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, Ac.Sc. USSR), Saratovskiy pedagogicheskiy institut (Saratov Pedagogical Institute) and Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: June 14, 1957

1. Boron florides--Spectra

AUTHOR: Kovalev, I.F.

51-4-5-3/29

TITLE: Vibration Spectra and Potential Energy Constants of Methylsilane and Methyltrideuterosilane (Kolebatel'nyye spektry i postoyannye potentsial'noy energii metilsilana i metiltrideyterosilana)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 5, pp 580-588 (USSR)

ABSTRACT: The force field and vibrational spectra of CH_3SiH_3 and CH_3SiD_3 were calculated using the method of Vol'kenshteyn et al. (Ref. 17) and Mayants (Ref. 20), using "spectroscopic masses" for hydrogen and deuterium. The calculations were made using the following geometrical parameters for the methylsilane molecule (Ref. 2): r(Si-C) = 1.857 Å, r(C-H) = 1.09 Å, r(Si-H) = 1.48 Å, with all angles tetrahedral. Values of the kinematic and dynamic coefficients in symmetry coordinates are given in Table 1. To find the force-field coefficients the author used results of the calculations for ethane (Ref. 17), disilane (Ref. 14), as well as experimental frequencies (Table 2). Force constants and induction coefficients were calculated for CH_3SiH_3. Distribution

Card 1/2

Vibrational Spectra and Potential Energy Constants of Methylsilane and Methyltrideuterosilane 51-4-5-5/29

of forces inside the CH_3SiH_3 molecule was found to differ considerably from the force distributions in ethane and disilane. Both frequencies and forms of the normal vibrations of methylsilane were calculated. They are given in Table 2, which shows that good agreement was obtained with experimental values (the mean absolute error does not exceed 5 cm^{-1}). The vibrational frequencies for methyltrideuterosilane (Table 2, last column) were also calculated. A full interpretation of the infrared vibrational spectrum of methylsilane is given. The author thanks M. M. Sushchinsky for his interest. There are 1 figure, 3 tables and 21 references, of which 11 are American, 8 Soviet, 1 German and 1 Czech.

ASSOCIATION: Saratovskiy pedagogicheskiy institut (Saratov Pedagogical Institute)

SUBMITTED: July 4, 1957

Card 2/2

1. Methylsilane - Vibration spectra 2. Methylsilane - Energy 3. Methyltrideuterosilane - Vibration spectra 4. Methyltrideuterosilane - Energy

AUTHORS: Babushkin, A. A., Kovalev, I. F., Yemel'yanova, V. M. SOV/48-22-9-33/40

TITLE: Spectroscopic Investigations of the Structure of Some Complex Compounds (Spektroskopicheskiye issledovaniya stroyeniya nekotorykh kompleksnykh soyedineniy) 1. Molecular Compounds $F_3B.NH_3$ and $F_3B.ND_3$ (1. Molekulyarnyye soyedineniya $F_3B.NH_3$ i $F_3B.ND_3$)

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1958, Vol 22, Nr 9, pp 1131 - 1131 (USSR)

ABSTRACT: This is a condensation of he paper which was published under the above subtitle Nr 1 in the "Izvestiya Akademii nauk SSSR" by A.A.Babushkin. The spectra of infrared absorption and of combination dispersion of the compounds in question were recorded in the laboratory of the Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry AS USSR). The field of force and the vibration spectra were computed by I.F.Kovalev. The computations were based upon the model C_{3v} for $F_3B.NH_3$ and upon the model C_s for $F_3B.NH_2D$ and $F_3B.NHD_2$. The spectrum

Card 1/2

Card 2/2

24(7), 24(4)

AUTHOR: Kovalev, I.F. SOV/51-6-5-6/...

TITLE: Calculation and Interpretation of the Vibrational Spectra of Tetramethylsilane and Tetramethylsilane-d_{12} (Raschet i interpretatsiya kolebatel'nykh spektrov tetrametilsilana i tetrametilsilana-d_{12})

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 5, pp 634-639 (USSR)

ABSTRACT: The potential energy constants and frequencies of normal vibrations of methylsilanes are of considerable interest in theoretical and experimental chemistry. Theoretical calculations of the spectral properties of SiH_3 (Ref 3) and CH_3SiH_3 (Ref 4) were already reported. The present paper deals with tetramethylsilane $Si(CH_3)_4$ which has four Si-C bonds. The author used experimental data on frequencies, degrees of depolarization and intensities of the Raman and infrared spectra of tetramethylsilane reported by various workers (Refs 8-17). The potential energy constants (force constants and "induction coefficients", and forms of normal vibrations of tetramethylsilane were calculated using the methods of Wolkenstein, Volkenshtein and Ptitsyn (Ref 1) and Mayants (Ref 2). The frequencies of the vibrational spectra of

Card 1/2

Calculation and Interpretation of the Vibrational Spectra of Tetramethylsilane and Tetramethylsilane-d_{12}

$Si(CH_3)_4$ and $Si(CD_3)_4$ were also calculated and interpreted. The calculated data are listed in Tables 1 and 2 (the latter gives the interpretation of the combination frequencies and harmonics in the infrared spectrum of tetramethylsilane). The calculated frequencies agreed well with the experimental ones, showing that the potential energy constants used describe accurately the force field of the tetramethylsilane molecule. Acknowledgment is made to M.M. Sushchinskiy for his advice. There are 2 tables and 18 references, 7 of which are Soviet, 10 English and 1 German.

SUBMITTED: June 7, 1958

S/051/60/008/03/007/038
E201/E191

AUTHOR: Kovalev, I.F.

TITLE: ~~Vibrational Spectra~~ and Potential Functions of Methylsilanes CH_3SiH_3, $(CH_3)_2SiH_2$ and $(CH_3)_3SiH$

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 3, pp 315-323 (USSR)

ABSTRACT: This paper is one of a series dealing with the force fields and vibrational spectra of the compounds $(CH_3)nSiH_{4-n}$, where n = 1, 2, 3 and 4. Earlier papers dealt with SiH_4 (Ref 1) and $(CH_3)_4Si$ (Ref 2); the first calculations for CH_3SiH_3 were also reported (Ref 3). The present paper describes calculations and reports more accurate values of the fundamental frequencies (Tables 2 to 5) and the force constants (Table 1) of methylsilane CH_3SiH_3, dimethylsilane $(CH_3)_2SiH_2$ and trimethylsilane $(CH_3)_3SiH$. The force fields, frequencies and forms of normal vibrations were calculated using the method of Vol'kenshteyn, Yel'yashevich, Stepanov (Ref 4) and Mayants (Ref 5). The calculations were carried out simultaneously for the whole series of methylsilanes

S/051/60/008/03/007/038
E201/E191

Vibrational Spectra and Potential Functions of Methylsilanes CH_3SiH_3 $(CH_3)_2SiH_2$ and $(CH_3)_3SiH$

$(CH_3)_nSiH_{4-n}$ using the results obtained earlier for ethane and disilane (Ref 3). The "spectroscopic mass" of hydrogen was used. Interpretation and comparison of the published experimental results with the calculated vibrational spectra of CH_3SiH_3 (Table 2), $(CH_3)_2SiH_2$ (Tables 3 and 4), and of $(CH_3)_3SiH$ (Tables 5 and 6) show good agreement between experiment and calculation.

Acknowledgements are made to M.M. Sushchinskiy for his advice, and to D. Marais (Union of South Africa), M. Randič (Yugoslavia) and N. Sheppard (England) for supplying their experimental results on the spectra of CH_3SiH_3 before publication.

Card 2/2

There are 2 figures, 6 tables and 12 references, of which 7 are Soviet, 3 English, 1 Scandinavian and 1 private communication.

SUBMITTED: July 11, 1959

KOVALEV, I.F.

Potential functions of molecules of the homologous series $(CH_3)nSiH_{4-n}$ (n= 1 - 4). Dokl.AN SSSR 134 no.3:559-562 S '60. (MIRA 13:9)

1. Saratovskiy gosudarstvennyy pedagogicheskiy institut. Predstavleno akad. I.V. Obreimovym.
(Silicon organic compounds) (Chemical structure)

KOVALEV, I.F.

Vibration spectrum and force field of the trimethylchlorosilane molecule. Opt. i spektr. 10 no.6:707-712 Je '61. (MIRA 14:8)
(Silane—Spectra)

S/020/61/136/006/009/024
B104/B204

53100 2209, 1153, 1372

AUTHOR: Kovalev, I. F.

TITLE: Potential functions of the molecular series $(CH_3)_nSiCl_{4-n}$ (n = 1-4)

PERIODICAL: Doklady Akademii nauk SSSR, v. 136, no. 6, 1961, 1313-1316

TEXT: The author calculated the coefficients of force and effect between the atoms of the molecules, the frequency and shape of normal oscillations, and interpreted the experimentally determined spectra. In the present paper, the results of calculating the coefficients of the above-mentioned effect are given. The following parameters (given in A) were taken from non-Soviet papers:

	r(C-H)	r(Si-C)	r(Si-Cl)
CH_3SiCl_3	1.093	1.876	2.021
$(CH_3)_2SiCl_2$	1.093	1.83	1.99
$(CH_3)_3SiCl$	1.093	1.89	2.09

Card 1/8

The denotation of the coordinates is given in Fig. 1; in Table 1 the coefficients of the above-mentioned effect are written down. When using these coefficients for calculating the oscillations, results are obtained, which show good agreement with experimental observations. The following conclusions are drawn: 1) When changing from tetramethylsilane to methylchlorosilane, the coefficients (Q_1,Q_1) decrease systematically, which is related with the extension of the distance Si-C. If one of the methyl groups is replaced by a chlorine atom, the jump is particularly large. A spectrum analysis shows an increase of the frequency of natural stretching vibrations. This is connected with the intensification of the covalent character of the bonds. 2) When the chlorine atoms are surrounded by silicon, a slight but systematic decrease of the coefficients is observed, which is related with the change in the length of the bond C - H. 3) The reciprocal bond Si-Cl leads to an increase of its strength. 4) The strength of the inner and outer angles of the CH_3 group is somewhat diminished. There are 1 figure, 1 table, and 14 references: 6 Soviet-bloc and 8 non-Soviet-bloc.

20633
S/020/61/136/006/009/024
B104/B204

Potential functions of the ...

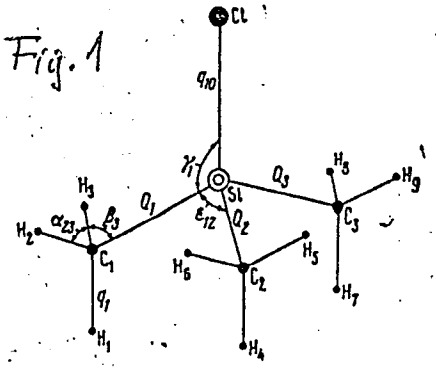
ASSOCIATION: Saratovskiy gosudarstvennyy pedagogicheskiy institut (Saratov State Pedagogical Institute)

PRESENTED: September 14, 1960, by I. V. Obreimov, Academician

SUBMITTED: September 10, 1960

Legend to Fig. 1:
Equilibrium configuration of the $(CH_3)_3SiCl$ molecule.

Fig. 1



Card 3/8

KOVALEV, I.F.

Potential functions of molecules of the homologous series $(CH_3)_n SiBr_{4-n}$ (n = 1 - 4). Dokl. AN SSSR 142 no.5:1069-1072 F '62. (MIRA 15:2)

1. Saratovskiy pedagogicheskiy institut. Predstavleno akademikom I.V.Obreimovym.
(Silane)

KOVALEV, I.F.

Calculation of intensities in the infrared spectra of molecules of the type XY_3ZV_3. Opt.i spektr. 12 no.5:550-556 My '62. (MIRA 15:5)

(Molecular spectra, (Silane)

KOVALEV, I.F.

Vibration spectrum of methyltribromosilane. Opt.i spektr. 13 no.1:63-67 Jl '62. (MIRA 15:7)
(Silane—Spectra)

KOVALEV, I.F.

Calculation of normal vibrations of dimethyldibromsilane and trimethylbromsilane. Opt. i spektr. 13 no.3:335-340 S '62. (MIRA 15:9)

(Silane--Spectra)

L 17791-63 EPR/EWP(j)/EPF(c)/EWT(m)/BDS ASD Ps-4/Pc-4/Pr-4 RM/WW/
MAY

ACCESSION NR: AP3005839 S/0051/63/015/002/0186/0189

AUTHOR: Kovalev, I.F.

TITLE: Vibrational spectrum and force field of methyl trifluorosilane

SOURCE: Optika i spektroskopiya, v.15, no.2, 1963, 186-189

TOPIC TAGS: force constant, vibrational spectrum, methyl silane

ABSTRACT: Investigation of the physical-chemical properties of simple organosilicon compounds is of considerable interest from the standpoints of molecular spectroscopy and chemistry in genera. Earlier the author carried out theoretical studies of the force fields and vibrational parameters of methyl fluorosilanes (I.F. Kovalev, Optika i spektroskopiya, 8,315,1960 and Doklady AN SSSR,134, 559, 1960) and of their chlorine and bromine substituted analogs (Doklady AN SSSR,136, 1313, 1961; Optika i spektro.,12, 11, 1962; Doklady AN SSSR, 142, 1069, 1962; Optika i spektro.,13, 63, 1962). The present paper gives the results for methyl trifluorosilane CH_3SiF_3, obtained as part of a comprehansive investigation of the $(CH_3)_n$-SiF_{4-n} (n = 1 to 4) homologous series. The parameters calculated were the force constants and the "influence" (coupling) coefficients. For CH_3SiF_3 the author used the data of R.L.Collins and J.R.Nielsen (J.Chem.Phys.,23, 351, 1955) on the infra-

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L 17791-63

ACCESSION NR: AP3005839

red and Raman spectra of this compound. The secular solutions were solved with the aid of "Strela" computer. The force constants for the various bonds in methyl trifluorosilane are listed. The values of the frequencies and atomic displacements, calculated on the basis of the force constants, are tabulated together with other data. The vibrational spectra are interpreted and the different stretching and deformation vibrations of different bonds and groups in the CH_3SiF_3 molecule are identified. The bond strengths and atomic displacements in the methyl trifluorosilane molecule are compared with the respective parameters in its chloro and bromo analogs. "The author is grateful to I.V.Obreimov for his interest in the work and valuable suggestions." Orig.art.has: 3 tables.

ASSOCIATION: none

SUBMITTED: 25Jan63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: PH NO REF SOV: 009 OTHER: 004

Card 2/2

KOVALEV, I.F.

Examination of vibration spectra of dimethyldifluorosilane and trimethylfluorosilane molecules. Coll Cz Chem 28 no.6: 1364-1373 Je '63.

1. Saratovskiy Gosudarstvennyy pedagogicheskiy Institut, Saratov, SSSR.

S/020/63/148/003/016/037
B191/B102

AUTHOR: Kovalev, I. F.

TITLE: Potential functions of the molecules of the homologuous series $(CH_3)_nSiF_{4-n}$ (n=1,..4)

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 3, 1963, 569-572

TEXT: The methods proposed by M.V. Vol'kenshteyn et al. (Kolebaniya molekul - Molecular vibrations -, 1, M.1949) and L.S. Mayants (Teoriya i raschet kolebaniy molekul - Theory and calculation of molecule vibrations -, 1960) are used for calculating bond strengths and mutual effects of the molecule groups in $(CH_3)_nSiF_{4-n}$ compounds. The forces due to vibrational changes in the bond lengths r are also determined. For CH_3SiF_3, $(CH_3)_2SiF_2$ and $(CH_3)_3SiF$ r(C-H) = 1.10, 1.09, 1.093; r(Si-C) = 1.88, 1.89, 0.87; and r(Si-F) = 1.55, 1.56, 1.55; r is given in Å for the equilibrium positions. The numerical results cover a table of two pages; they show how the forces and the mutual effects change from one

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compound to the other. This change is governed by a certain law: If a methyl group is replaced by F atoms the Si-C bond strength increases by about 10%. Similar effects are also observed on Cl or Br substitution. If halide atoms are added to Si atoms an induction effect is observed, i.e. the molecular electron shell is displaced toward the halide. The Si-F bond strength increases with the number of F atoms at the Si. The C-H bond strength and the HCH angles remain almost equal for all molecules. The valency ν(C-H) and inner stretching vibrations $\delta(CH_3)$ in methylhalide-silanes are characteristic in frequency and shape. The changes in bond length due to these vibrations are calculated with an accuracy of 0.0001 Å. These changes are of the order of 0.001 to 0.01 Å and depend very little on n, except for ν(Si-Hal), where they amount to 0.0263 for n=1, 0.0096 for n=2 and 0.0035 for n=3. There are 1 figure and 3 tables.

ASSOCIATION: Saratovskiy gosudarstvennyy pedagogicheskiy institut (Saratov State Pedagogical Institute)

PRESENTED: August 1, 1962, by I.V. Obreimov, Academician

SUBMITTED: August 1, 1962

L 46D8-65 EWT(l) IJP(c)

ACCESSION NR: AR5012230 UR/0058/65/000/003/D014/D014

SOURCE: Ref. zh. Fizika, Abs. 3D89 13

AUTHOR: Morozov, Yu. P.; Novikov, I. I.; Ioffe, A. Ya.; Shlebnikova, V. N.; Kyasha, N. I.; Kovalchuk, O. S.

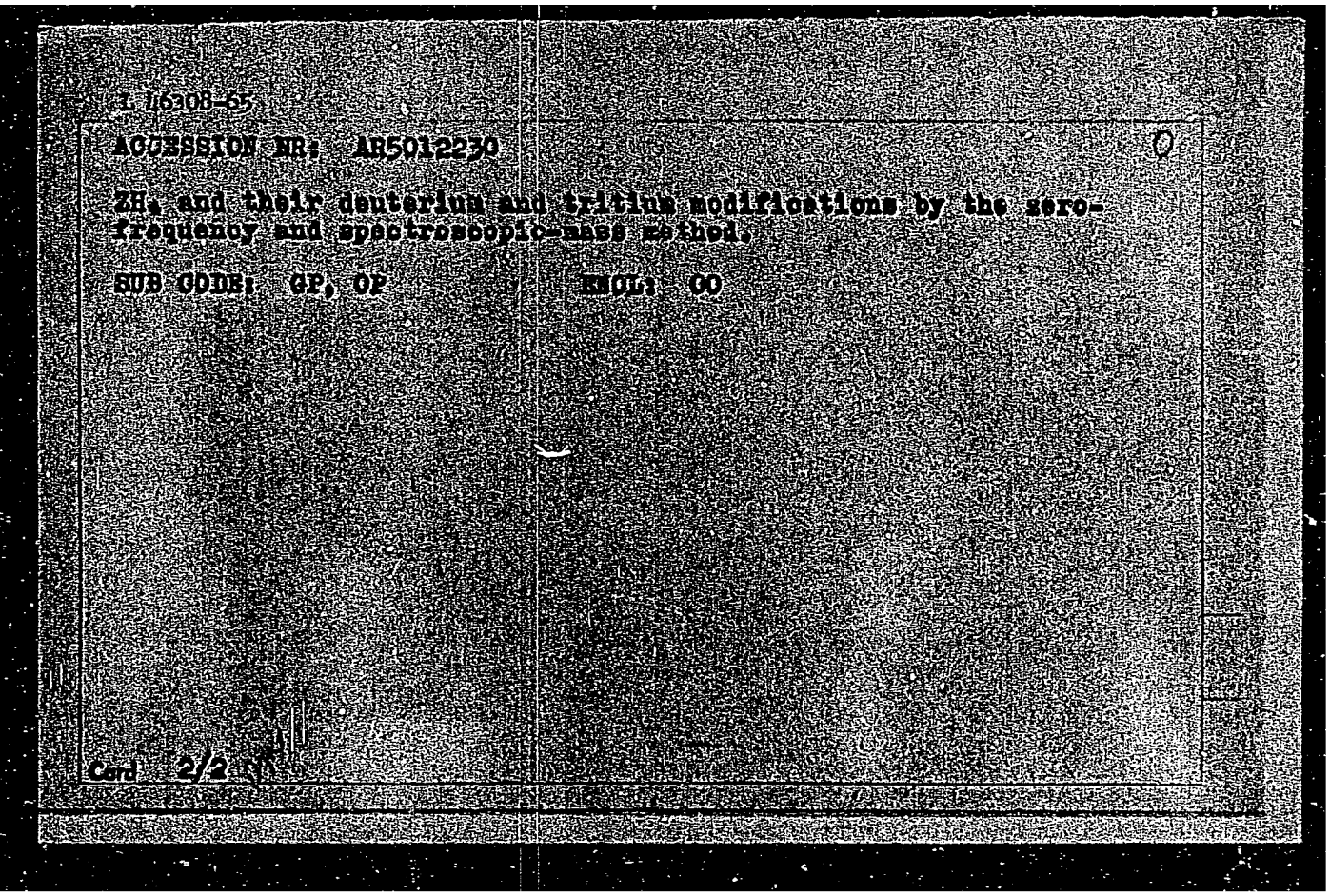
TITLE: Calculation of vibrational spectra of simple molecules with account of unharmonicity 21

CITED SOURCE: Tr. Komis. po spektroskopii, AN SSSR, vyp. 1, 1964, 170-175

TOPIC TAGS: vibrational spectrum, anharmonicity, electro-optical parameter, force constant, infrared intensity

TRANSLATION: Methods of quantum mechanics are used to justify linear classical methods accounting for anharmonicity. A derivation is given for three variants of formulas for the calculation of the electro-optical parameters of molecules of the type XY_2Z_2 and XY_3Z. The force constants, the vibrational frequencies, the forms of oscillations, the electro-optical parameters, and the intensities are calculated for the infrared spectra of hydrides of the type XH_2, XH_3,

Card 1/2



L 16308-65

ACCESSION NR: AR5012230

ZH, and their deuterium and tritium modifications by the zero-frequency and spectroscopic-mass method.

SUB CODE: GP, OP ENCL: 00

Card 2/2

L 10704-65 EWT(l)/EED(k)-2/EWG(k) Pi-4 IJP(c) BSD(dp)/RAEM(a)/ESD(gs)/ESD(t)/AFWL(t)/T/

ASD/ASD(a)-5

ACCESSION NR: AP4043879 S/0139/64/000/001/0173/0179

AUTHOR: Kovalev, I. F.

TITLE: Calculation of electro-optical parameters and intensities in the infrared spectra of molecules of the type XY_4, XY_3Z, and XY_2Z_2

SOURCE: IVUZ. Fizika, no. 4, 1964, 173-179

TOPIC TAGS: infrared spectrum, electro optical parameter, vibration spectrum, tetrahedral molecule, crystal symmetry, molecular electronics

ABSTRACT: In view of their importance to the theory of the structure of matter, the author derives general formulas for the calculation of the electro-optical parameters and band intensities of infrared absorption vibration spectra for several simple molecules of the type XY_nZ_{4-n} (n = 2--4). Three cases are considered: 1) arbitrary angles between bonds, 2) tetrahedral angles, 3) isotopic series of

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L 10704-65

ACCESSION NR: AP4043879

molecules. For the case of tetrahedral angles, the kinetic-energy matrices are expressed in terms of the symmetry coordinates. The displacements of the atoms in normal vibrations, the electro-optical parameters, and the intensities are calculated. In the case of tetrahedral molecules, relations are derived showing the general dependence of the atomic displacements on the masses of the atoms and on the lengths of the bonds. These formulas will be applied in a future article to monosilane and its deuterium substitutes. Orig. art. has: 1 figure and 5 formulas.

ASSOCIATION: Saratovskiy gospedinstitut (Saratov State Pedagogical Institute)

SUBMITTED: 23Apr63 ENCL: 00

SUB CODE: SS, OP NR REF SOV: 004 OTHER: 000

Card 2/2

L 13077-65 EWT(l)/EWT(m)/EPF(c)/T/EWP(t) Pad-1/Pr-4 IJP(c)/AFWD(t)
RM
ACCESSION NR: AP4047355 S/0139/64/000/005/0102/0105

AUTHOR: Kovalev, I. F.

TITLE: Calculation of electro-optical parameters and intensities in the ir spectra of molecules of the type XY_4, XY_3Z, and XY_2Z_2. II. The series SiH_nD_{4-n} (n = 0--4)

SOURCE: IVUZ. Fizika, no. 5, 1964, 102-105

TOPIC TAGS: electrooptical parameter, ir intensity, ir spectrum, monosilane

ABSTRACT: Using the connection between the natural coordinates (changes in the equilibrium bond lengths and the values of the angles) and the displacements of the atoms from the equilibrium positions under vibrations, and using the kinetic-energy coefficients calculated in the first part of the article (Izv. vuzov SSSR, fizika No. 4, 173, 1964), the author derives in general form relations for

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L 13077-65
ACCESSION NR: AP4047355

the calculation of the displacements of the atoms under normal vibrations in the XY_4 molecule. Formulas are also derived for the calculation of the electro-optical parameters and the intensities of the infrared vibrational bands of monosilane and its deuterium substitutes. The displacements of the atoms, the electro-optical parameters, and the intensities are also calculated. Because of the high symmetry of the XY_4 molecule, the frequencies, shapes, and displacements of the atoms for vibrations of type F_2 do not depend on the interaction of the adjacent angles, but for vibrations of type E they depend on the interaction between the bonds themselves and between the angles and the bonds. The atom displacements in the vibrations of type A_1 do not depend explicitly on the masses of the atoms and the bond lengths, and in the case of E-type vibrations they are independent of the masses of the atoms. The electro-optical parameters are calculated in the first approximation of the valence-electron scheme on the basis of experimental data on the intensities for SiH_4. Comparison of the results obtained for SiD_4 with the data

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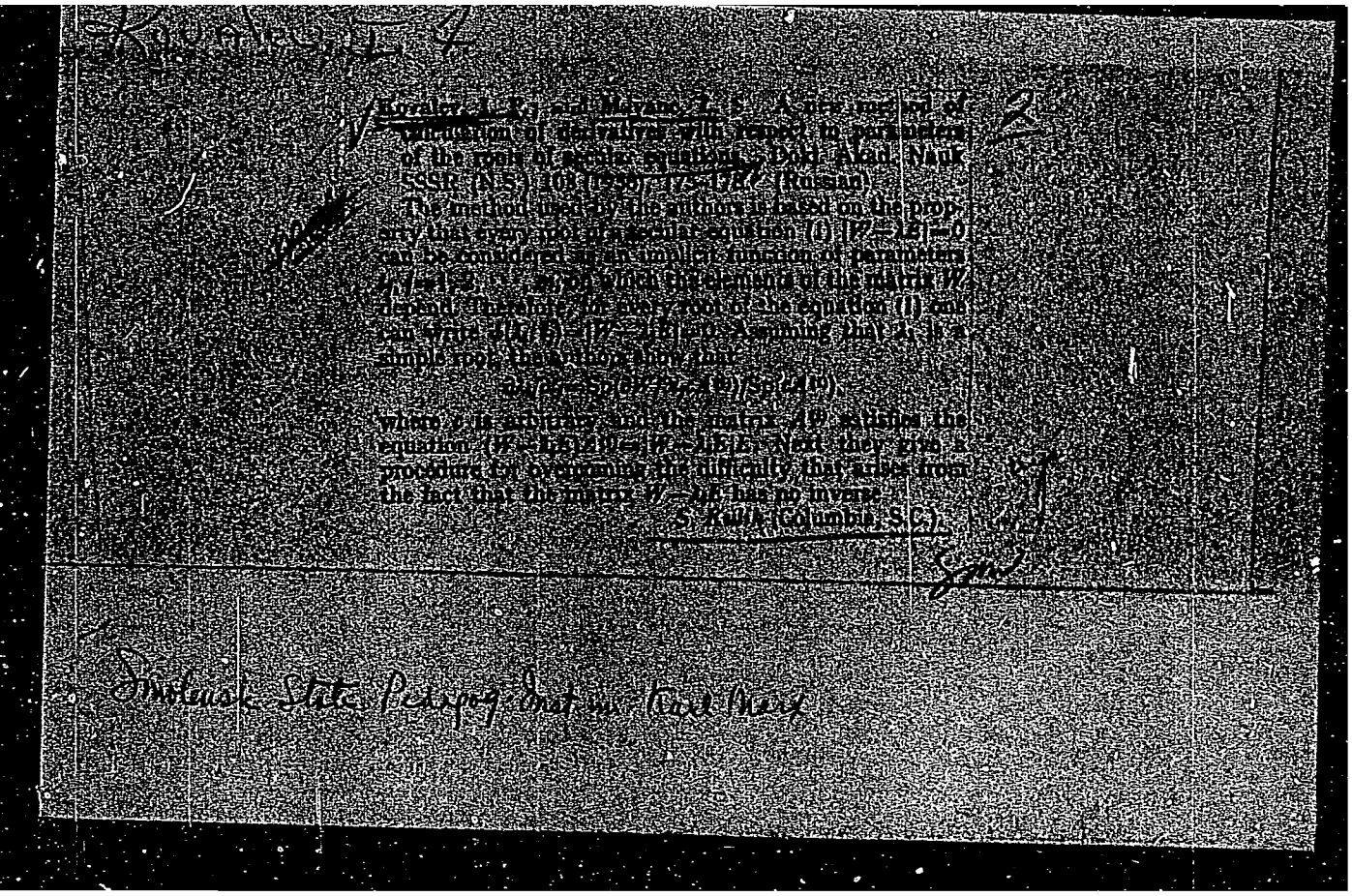
Card 3/3

VAGANOVA, I.P.; KOVALEV, I.F.

Calculation and interpretation of the vibrational spectrum of disilylmethane. Opt. i spektr. 17 no.6:960-961 D '64.
(MIRA 18:3)



KOVALEV, I.F.

Vibrational spectrum and force field of methyltrifluorosilane. Opt. i spekt. 15 no.2:186-189 Ag '63. (MIRA 17:1)

KOVALEV, I. F.

"Experimental Data on the Antagonism to Biological Action of Individual Portions of the Radiant Energy Spectrum." Cand Med Sci, Odessa State Medical Inst, Odessa, 1953. (RZhBiol, No 6, Nov 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)

SO: Sum. No. 521, 2 Jun 55

KOVALEV, I.F.

Specificity of biological activity of ionizing radiations. Med.rad. 1 no.4:7-14 Jl-Ag '56. (MLRA 9:12)

1. Iz Ukrainskogo nauchno-issledovatel'skogo eksperimental'nogo instituta glaznykh bolezney i tkanevoy terapii im. akad. V.P.Filatova (dir. - akad. V.P.Filatov)

(RADIATIONS, eff.
ionizing radiations on biol. substances)

Kovalev I.F.

EXCERPTA MEDICA SEC. 12 Vol. 12/8 Ophth. Aug. 58

1422. PATHOGENESIS AND PRINCIPLES OF TREATMENT OF RADIATION CATARACTS (EXPERIMENTAL INVESTIGATION) (Russian text) - Kovalev I. F. - OFTALM. ZH. 1956, 5 (271-278)

Experiments were carried out on 192 rabbits (350 eyes) irradiated with roentgen rays in doses of 600-3000 r., with an observation time of up to 2 years. Histologic examinations were made on 78 crystalline lenses, including 11 lenses from control (unirradiated) eyes. Development of cataract was studied by biomicroscopic and histomorphologic methods. Biomicroscopical examination revealed the appearance in the irradiated eye of irregular delicate radial, granular or floccular opacities on the anterior surface of the lens just beneath the anterior capsule. All 3 types of opacification developed within 3-4 months after the irradiation. Histomorphologic examination revealed pictures of damage to the normal structure which varied with the development of the process and of its course. The author believes that the immediate cause of cellular death following an ionizing radiation is not the radiation damage to the cells but changes in the conditions of the medium to which normal cells must adapt by means of morphologic and functional reconstruction. Resulting from the specific action of ionizing irradiation the regular differentiation process of the epithelial cells of the lenticular equatorial zone is disturbed both in the direction of formation of epithelium and of formation of lenticular fibres. It was found that after large single doses (more than 1500 roentgens) a suppression of barrier and trophic functions of the anterior and posterior capsular epithelium came to the foreground. The disturbances of the differentiation process of the lenticular epithelium are regarded as a basic link in the mechanism of the development of irradiation cataract. The solution of the problem of a rational treatment of the lenticular radiation damage (also of radiation damage to other tissue) must proceed along the lines of study of the factors which would stimulate the adaptive function and the differentiation process of the cells.

(S)

KOVALEV, I. F.

"The Specific Nature of the Biological Action of Ionizing Radiation," by I. F. Kovalev, Candidate of Medical Sciences, Ukrainian Experimental Institute of Ophthalmic Diseases imeni V. P. Filatov (director, Academician V. P. Filatov), Vestnik Rentgenologii i Radiologii, Vol 31, No 4, Jul/Aug 56, pp 54-63

Tests were run on infusoria (Paramaecium caudatum) in an effort to elucidate the specific nature of the biological effects of ionizing radiation. Radiation injuries caused by varying doses of X rays could be classified into three stages: 1) First stage in which infusoria were irradiated by small doses. A practically irreversible decreased capacity for adaptation to new conditions of external environment occurred, with evidence of some slowing of the functions of multiplication. (2) By using larger doses there was a decrease or loss of the function of multiplication and motion in addition to decreased adaptation, but the disturbance of conjugation and motion was easily reversible and was not transmitted to subsequent generations. (3) The third stage is characterized by the irreversible loss of the function of adaptation, reproduction, and motion and death under rays.

SUM. 1305

KOVALEV, I.F.

The author concludes that injuries appearing in the first stage and due to small doses are specific and are expressed in the decreased function of adaptation while all the other vital functions remain intact. The biological action of ionizing radiation in the second and third stages, however, are nonspecific and are expressed in a general denaturation of important enzyme and protein complexes.

The comparative relationship between intensity of ionizing radiation to specific and nonspecific injuries are: with the increase of dose there is an appropriate increase of intensity of nonspecific general-denaturation symptoms, but increasing the dose has very little effect on the specific effect.

SUM. 1305

KOVALEV, I.F., starshiy nauchnyy sotrudnik

Critique of certain basic concepts in radiobiology. Vest.rent.i rad. 33 no.3:52-57 My-Je '58 (MIRA 11:8)

1. Iz Ukrainskogo nauchno-issledovatel'skogo eksperimental'nogo instituta glaznykh bolezney i tkanevoy terapii imeni akad. V.P. Filatova (dir. N.A. Puchkovskaya).
(RADIOLOGY,
radiobiol. basic concepts (Rus))
(BIOLOGY,
basic concepts (Rus))

ACC NR: AR6000108 SOURCE CODE: UR/0058/65/000/008/D017/D017

SOURCE: Ref. zh. Fizika, Abs. 8D131

AUTHOR: Kovalev, I. F.

ORG: none

TITLE: Vibration spectra and potential-energy constants of methyl fluorosilanes

CITED SOURCE: Sb. Spektroskopiya. M., Nauka, 1964, 106-110

TOPIC TAGS: fluorinated organic compound, vibration spectrum, oscillation strength

TRANSLATION: The vibration problem was solved for the homological series $(CH_3)_nSiX_{4-n}$ (n = 1--4, X = H, Cl, Br, F). An analysis of the results of the calculations shows practically complete agreement between the computed and measured frequencies of almost all normal oscillations. The frequencies are classified by oscillation modes and are interpreted. The values of the force coefficients of methyl fluorosilanes are given. The results of the calculations are discussed. I. Yakovlev.

SUB CODE: 20, 07/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000

Card 1/1 rds

KOVALEV, I.G., inzh.

Readjustable pneumatic-mechanical device for the assembling and tack welding of electric motor bodies. Svar.proizv. no.4:34-35 Ap '64. (MIRA 18:4)

1. Novosibirskiy turbogeneratornyy zavod im. XX s"yezda Kommunisticheskoy partii Sovetskogo Soyuza.

KOVALEV, I.F. (Leningrad)

Archival materials on hydraulic engineering and melioration.
Gidr. i mel. 16 no.9:60 S '64. (MIRA 17:11)

KOVALEV, I.F.

Calculation of the electro-optical parameters and intensities in the infrared spectra of molecules of the type XY_4, XY_3Z, and XY_2Z_2. Izv. vys. ucheb. zav.; fiz. no.5:102-105 '64.

1. Saratovskiy pedagogicheskiy institut. (MIRA 17:11)

L 58896-65 EPR/EWP(t)/EWP(b) Pc-4 IJP(c) JD/JGH/JT

ACCESSION NR: AP5019050 UR/0286/65/000/012/0077/0077

669.721.5

AUTHOR: Kovalev, I. G.; Mikheyev, I. N.; Dolgov, V. V.; Shpagin, B. V.; Mishkin, V. L. 27 B

TITLE: High-strength magnesium alloy. Class 40, No. 172050

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 12, 1965, 77

TOPIC TAGS: magnesium alloy, high strength alloy, high strength magnesium alloy, magnesium weldable alloy

ABSTRACT: This Author Certificate introduces a high-strength magnesium alloy containing zinc, cadmium, and zirconium. In order to improve mechanical properties and weldability, the alloy contains 2—4% zinc, 1—2% cadmium, 0.3—1% zirconium, 0.5—2% lanthanum, and the remainder is magnesium. [WW]

ASSOCIATION: Organizatsiya gosudarstvennogo komiteta po aviatsionnoy tekhnike SSSR (Organization of the State Committee on Aviation Engineering, SSSR)

SUBMITTED: 030ct63 ENCL: 00 SUB CODE: MM, AS

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4051

Card 1/1

PRUDKIN, Ya.M., gornyy inzh.; KOVALEV, I.G., gornyy inzh.;
BATMANOV, Yu.K., gornyy inzh.

Effect of the increased advance rate or length of the longwall on the improvement of technical and economic indices.
Ugol' 37 no.1:22-24 Ja '62. (MiRA 15:2)
(Mining engineering)

GRIDIN, A.D., inzh.; SAMSON, G.N., inzh.; PRUDKIN, Ya.M., inzh.; KOVALEV, I.G., inzh.

Ways of obtaining a record-high operative capacity of coal cutter loaders. Ugol' 37 no.8:49-56 Ag '62. (MIRA 15:9)

1. Gosudarstvennyy proyektno-konstruktorskiy i eksperimental'nyy institut ugol'nogo mashinostroyeniya.
(Coal mining machinery)
(Coal mines and mining--Labor productivity)

KOVALEV, I.G., inzh.; KHEYLIK, V.Z., inzh.; SHADKHAN, V.M., inzh.

Efficiency in using new means of mechanizing ore mining operations at upper Kama potash mines. Gor.zhur. no.1:6-10 Ja '65.

(MIRA 18:3)

1. Gosudarstvennyy proyektno-konstruktorskiy i eksperimental'nyy institut ugol'nogo mashinostroyeniya (for Kovalev, Kheylik).
2. Gosudarstvennyy soyuznyy institut po proyektirovaniyu predpriyatiy gornokhimicheskoy promyshlennosti (for Shadkhan).

KOVALEV, I. G.

137-58-1-727

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 108 (USSR)

AUTHOR: Kovalev, I. G.

TITLE: A Die for Cutting Hexagonal M8, M10 and M12 Bolt Heads (Shtamp dlya vyrubki shestigrannykh golovok boltov M8, M10 i M 12)

PERIODICAL: Mashinostroitel', 1937, Nr 5, p 38

ABSTRACT: A die for cutting hexagonal heads for M8, M10 and M12 bolts has been developed and introduced. The blank used is a turned or cold-upset bar with a round head cut on six sides in dies of EI-161 or 9KhS steel. The clearance between the die halves when the plunger is in the low position is 0.3-0.5 mm. The die is provided with a guard and guides.

V. Ya.

1. Dies--Development 2. Dies--Characteristics

Card 1/1

KOVALEV, I.G.

Translation from: Referativnyy Zhurnal, Mashinostroyeniye, 1957, Nr 1, p. 75, (USSR) 123-1-450

AUTHOR: Kovalev, I. G.

TITLE: Trimming and Blanking Die for Holes for Threading (Shtamp dlya otbortovki otverstiya pod rez'bu i vyrubki kontura)

PERIODICAL: Sbornik ratsion.predlozh. Min-vo Elektrotekhn.Prom-sti SSSR, 1956, Nr 3 (61), p.17-18

ABSTRACT: Trimming holes in workpieces was done before in a second operation after the part was blanked, and often creating the spoilage along the draws. A new, combined die with special trimming punch is proposed. This one will simultaneously pierce the hole and trim it with the progressive movement of the slide; then, after the stock is moved two stops, the part is blanked. To avoid ragged edges it is recommended to use the die in a slow-operating press.

M.I.N.

Card 1/1

KOVALEV, I. G.

137-58-1-1884

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 254 (USSR)

AUTHORS: Kovalev, I.G., Kovaleva, Z.N.

TITLE: Hardening of Mg-Zn-Zr Alloys by a Combination of Heat and Mechanical Treatment (Termomekhanicheskoye uprochneniye splavov sistemy Mg-Zn-Zr)

PERIODICAL: V sb.: Metallurg. osnovy lit'ya legkikh splavov. Moscow, Oborongiz, 1957, pp 429-441

ABSTRACT: The properties of alloys of the Mg-Zn-Zr system, VM65-3 and VM65-1, are described. Alloys VM65-1 and VM65-3 are strengthened by aging, in the process of which a finely dispersed hardening phase $MgZn_2$ is liberated. Various aging procedures are examined. The following optimum aging regime after hot extrusion is recommended: temperature 150°, holding 24 hours. Annealing on extruded semi-finished products at 350° for 1 hour leads to softening as a result of re-crystallization and partial solution of the hardening phase, and therefore annealing should not be performed if high mechanical properties are to be preserved. Re-extrusion of alloys provides a finer crystalline structure and increases strength as compared to a single

Card 1/2

137-58-1-1884

Hardening of Mg-Zn-Zr Alloys by a Combination of Heat (cont.)

extrusion. Hot drawing at 240-250° reveals a 3-5 percent increase in the strength of extruded blanks.

P.V.

1. Alloys--Hardening 2. Alloys--Heat treatment

Card 2/2

KOVALEV, I. G.

Davydov, Yu. P.; I. G. Kovalev; and G. V. Pokrovkiy. Special Features of Sheet Forming of Aircraft Steel and Aircraft Alloys. p.103

Pressure Treatment of Alloys; Collection of Articles, Moscow, Oborongiz, 1958, 141pp.

KOVALEV, I.G.

PHASE I BOOK EXPLOITATION SOV/4164

Vsesoyuznoye soveshchaniye po splavam redkikh metallov. 1st, Moscow, 1957

Redkiye metally i splavy; trudy... (Rare Metals and Alloys; Transactions of the First All-Union Conference on Rare-Metal Alloys) Moscow, Metallurgizdat, 1960. 438 p. 3,150 copies printed.

Sponsoring Agencies: Akademiya nauk SSSR. Institut metallurgii; USSR Komissiya po redkim metallam pri nauchno-tekhnicheskom komitete.

Ed.: I.I. Shapovalov; Ed. of Publishing House: O.M. Kamayeva; Tech. Ed.: P.G. Islent'yeva.

PURPOSE: This collection of articles is intended for metallurgical engineers, physicists, and workers in the machine-building and radio-engineering industries. It may also be used by students of schools of higher education.

COVERAGE: The collection contains technical papers which were presented and discussed at the First All-Union Conference on Rare-Metal Alloys, held in the Institute of Metallurgy, Academy of Sciences USSR in November 1957. Results of investigations of rare-metal alloys, titanium, and copper-base alloys with additions of rare metals are presented and discussed along with investigations of rhenium, vanadium, niobium, and their alloys. The effect of rare-earth metals on properties of magnesium alloys and steels is analyzed. The uses of rhenium as a dehydrating catalyst, electroplating material, and material suitable for making plugs for automobile electrical systems are discussed. Also, the effect of the addition of certain elements on the properties of heat-resistant steel is examined and alloys with special physical properties (particularly semiconductive alloys) are discussed. No personalities are mentioned. Soviet and non-Soviet references accompany some of the articles.

PART II. TITANIUM, AND COPPER-BASE ALLOYS WITH RARE-METAL ADDITIONS

Rare Metals (Cont.) SOV/4164

Lebedeva, T.V., I.G. Kovalev, and O.V. Yemel'yanova. Wrought Magnesium Alloys With Rare-Earth Metals 209

Tikhova, N.M., V.A. Blokhina, and L.A. Afanas'yeva. Magnesium Casting Alloys With Rare-Earth Metals 219

Drits, M.Ye., M.V. Mal'tsev, Z.A. Sviderskaya, Ye.M. Padezhnova, and I.M. Havykina. Investigation of Magnesium Alloys Containing Thorium 227

Afanas'yeva, Ya.Ye. Magnesium Alloys With Rare Metals 240

Mikheyev, I.M., and V.V. Dolgov. Effect of Rare-Earth and Alkali-Earth Metals on Mechanical Properties of Magnesium Alloys of the Magnesium-Manganese and Magnesium-Manganese-Cerium Systems 259

PART V. RARE METALS IN STEELS

Reznikova, S.Ya. Effect of Rare-Earth Metals on Sulfur Distribution and Sulfide Composition in Chromium-Nickel-Molybdenum Steel 269

Card 6/8

69831

18.1245

S/136/60/000/05/012/025
E071/E235

AUTHORS: Kazakov, A. A., Kovalev, I. G., and Kolpashnikov, A. I

TITLE: Heat Resistant Deformable Magnesium Alloy MA13

PERIODICAL: Tsvetnyye metally, 1960, Nr 5, pp 62-65 (USSR)

ABSTRACT: On the basis of preliminary investigations of various magnesium alloys, carried out during 1956 to 1957 by VIAM, and literature data, an alloy of the system Mg-Th-Mn under the name of MA13 (similar in composition to an American alloy NM21KhA) was found to be the most heat resistant and was chosen for more detailed investigations; the results of these are reported in the paper. A few heats of the alloy were prepared for the investigation in a steel crucible (12 kg) with the application of flux VI2. Magnesium and alloying addition MGS-1 was melted at 700 to 720°C. Thorium was introduced in the form of turnings at 800°C in a preheated bell. During the introduction of thorium, the surface of the metal bath was covered with a small amount of flux containing 55% of KCl, 28% of $CaCl_2$, 15% of $BaCl_2$ and 2% of CaF_2. The alloy (cooled to about 720 to 740°C) was cast into metal moulds, preheated to 100 to 150°C. The experimental ingots (25 x 150 x 300 mm) were rolled into sheets 1 to 6 mm

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69831
S/136/60/000/05/012/025
E071/E235

Heat Resistant Deformable Magnesium Alloy MA13

thick, on a two high mill, with rolls 4000 mm in diameter, preheated to 100 to 120°C. Temperature at the beginning of rolling 450 to 500°C, at the end of rolling 300 to 350°C, reduction per pass 20 to 30%. Rolled sheets were thermally treated with an intermediate cold rolling: a) heating (for hardening) to 550 to 560°C with a 30 minute soaking in a protective atmosphere (sulphurous gas) and cooling in air; b) cold rolling with total reduction of 7 to 10%; c) ageing at 200°C for 16 hours. After hardening, the sheets were pickled in a 5% solution of nitric acid and hand dressed. After hot rolling, the alloy possessed a fibrous structure of a deformed, partially recrystallised material. After hardening, a fully recrystallised equiaxial structure is formed. The physical properties of the alloy are entered in Table 1; the mechanical properties are given in Table 2; a comparison of the mechanical properties of the alloys MA11, MA2-1, MA8 with those of MA13 are given in Tables 3, 4 and Fig 4. It was found that at temperatures above 240°C alloy MA13 possesses superior mechanical properties

Card 2/3

KOVALEV I.I.

DANILOVA, G.V.; LOYTER, M.N.; ALEKSEYEV, N.A.; KOVALEV, I.I.; DANILOV, A.Ye.; SHENDRIKOV, G.L., i.o. glavnogo metodista; ORLOVA, V.P., redaktor; PAVLOVA, M.M., tekhnicheskiy redaktor

["Water resources management and rural hydroelectric power stations" pavilion; a guidebook] Pavil'on "Vodnoe khoziaistvo i sel'skie gidroelektrostantsii"; putevoditel'. Moskva, Gos. izd-vo selkhoz. lit-ry, 1956. 21 p. (MIRA 9:12)

1. Moscow. Vsesoyuznaya sel'skokhozyaystvennaya vystavka, 1954-
2. Direktor pavil'ona (for Danilova)
(Moscow--Agricultural exhibitions)
(Water supply, Rural)
(Hydroelectric power stations)

KOVALEV, I.I., inzh.lesnogo khozyaystva (stantsiya Sukhinichi)

New method of shelterbelt tillage. Put' i put. khoz. no.4:33-34 Ap '58. (MIRA 11:4)
(Windbreaks, shelterbelts, etc.) (Plows)

Films of gallium arsenide and their properties. V. A. Presnov, L. G. Lavrent'yeva, M. D. Vilisova, I. K. Kovalev.

On the physico-chemical nature of the formation of contacts of gallium arsenide with metals. V. A. Presnov, A. N. Vyatkin. (Presented by A. N. Vyatkin--10 minutes).

Report presented at the 3rd National Conference on Semiconductor Compounds, Kishinev, 16-21 Sept 1963

L 32620-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD
ACC NR: AR6000072 SOURCE CODE: UR/0275/65/000/009/B011/B011

AUTHOR: Lavrent'yeva, L. G.; Kovalev, I. K.

TITLE: Preparation of single-crystal germanium film by sputtering in vacuum

SOURCE: Ref. zh. Elektronika i yeye primeneniye, Abs. 9B89

REF SOURCE: Dokl. Nauchno-tekhn. konferentsii, posvyashch. dnyu radio. Tomsk, Tomskiy un-t, 1964, 3-6

TOPIC TAGS: single crystal, semiconductor single crystal, germanium single crystal

ABSTRACT: Epitaxial films of Ge were obtained at substrate temperatures of the order of 450—500°C. Ge of p-type was sputtered from a tungsten spiral onto an n-type Ge substrate. The source temperature was 1100 to 1300°C. The base temperature was maintained by an external heater within a range of 450 to 650°C. The pressure in the system was 10^{-5} mm Hg. The optimum sputtering rate was found to be 1 μ/min. At high sputtering rates a film with a fine-grained deposit on the surface was obtained. The film thickness was 3 to 15 μ. Sputtering of a p-type film on an n-type Ge substrate resulted in the formation of p-n junctions. The contact was fused into the film with pieces of Sn in air at a temperature close to the melting point of Sn. Films not protected by Sn were etched away with perhydrol.

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L 32620-66

ACC NR: AR6000072

The volt-ampere characteristics of the obtained p-n junctions indicated a rectification coefficient of 2600, a forward current of 520 μamp, and a back current of 200 μamp. The relatively high back currents were apparently caused by the higher concentration defects in the film. Refs.: 3.

N.Sh.

SUB CODE: 20/ SUBM DATE: none

Card 2/2

ZHDANOVSKIY, N.S.; KOVALEV, I.M.; KHASHCHINSKIY, V.P., professor.

[Rural thermal electric power stations] Sel'skie teplovye elektrostantsii. Pod red. V.P.Khashchinskogo. Moskva, Gos. izd-vo sel'khoz. lit-ry, 1953. 123 p. (V pomoshch' sel'skim elektrifikatoram) (MLRA 7:3)

(Electric power plants) (Heat engines)

KOVALEV, I.M., inzh.; KOSHUKHAR', G.I., inzh.

Annealing malleable cast iron in continuous electric furnaces with a protective atmosphere. Mashinostroenie no.1:70 Ja-F '66. (MIRA 18:4)

KOVALEV, I.M., inzh.

Automatic machine for the heat treatment of disks. Mashinostroenie no.2:26-27 Mr-Ap '65. (MIRA 18:6)

L 3272-66 EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c) JD/HM

ACC NR: AP5025606 UR/0135/65/000/010/0004/0006

621.791.75.01:538.122

AUTHOR: Kovalev, I. M. (Engineer)

TITLE: Deflection of welding arc in a transverse magnetic field

SOURCE: Svarochnoye proizvodstvo, no. 10, 1965, 4-6

TOPIC TAGS: arc welding, transverse magnetic field, plasma jet, welding electrode, tungsten

ABSTRACT: The deflection of the welding arc in a transverse magnetic field of constant intensity is the most elementary form of the interaction between the arc's magnetic field and the controlling magnetic field. The pattern of this deflection is determined by an analysis of the forces acting on the arc-discharge plasma. In this connection the authors present the results of an experimental investigation performed to verify the theory that the model of a flexible conductor with current applies to this arc. A homogeneous magnetic field was created by means of coils. The relationship between the intensity of the transverse magnetic field H, the arc length l, and the current intensity I was determined by means of a device consisting of electrode 1 and fixed anodes 2 and 3 isolated from one another and connected in parallel to the circuit of the arc current (see Fig. 1 of the Enclosure), on fixing at e.g. 60° the angle of deflection of a DC direct-polarity (W-Cu) arc burning in

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L 3272-66

ACC NR: AP5025606

argon (tungsten electrode) within the transverse magnetic field. On this basis, it is shown that the compression of the arc column by the intrinsic magnetic field and its stabilization by the plasma jet endow the arc with the properties of a flexible conductor with current, whose deviation in the transverse magnetic field obeys Ampere's law. Thus, the specific property of the arc as a plasma conductor consists in that the Lorentz forces induced in the arc column by the intrinsic magnetic field of the moving charges are directed toward the column's center. These forces, compressing the column, create a pressure field whose gradient compensates the Lorentz forces:

$$\operatorname{grad} p = \frac{1}{c}[\bar{j}\bar{H}]. \quad (1)$$

On this basis, the author derives empirical formulas for determining the deflection angle and anode-spot displacement of the arc in the presence of a transverse magnetic field of constant intensity. Orig. art. has: 7 figures, 11 formulas.

ASSOCIATION: MVTU im. Baumana

SUBMITTED: 00 ENCL: 01 SUB CODE: IE, EM

NO REF SOV: 004 OTHER: 001

Card 2/3

L 3272-66

ACC NR: AP5025606

ENCLOSURE: 01

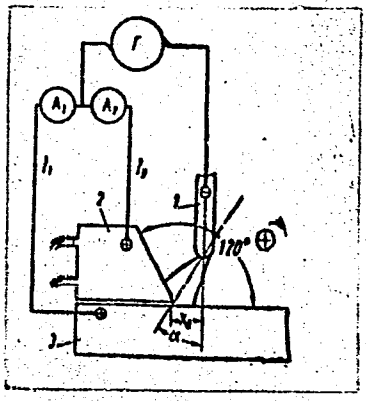

Fig. 1. Diagram of device for investigating the pattern of deflection of the arc in a constant magnetic field.

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L 3271-66 EWT(m)/EWP(v)/T/EWP(t)/EWP(k)/EWP(b)/EWA(c) JD/HM

ACC NR: AP5025607

UR/0135/65/000/010/006/0009
621.791.75.01:538.122

AUTHOR: Kovalev, I. M. (Engineer); Akulov, A. I. (Doctor of technical sciences)

TITLE: Stability of welding arc in a transverse magnetic field

SOURCE: Svarochnoye proizvodstvo, no. 10, 1965, 6-9

TOPIC TAGS: arc welding, transverse magnetic field, welding arc stability, welding electrode

ABSTRACT: The possibility of controlling the stability of the welding arc by means of a transverse magnetic field is markedly restricted by the arc's inability to elongate without disrupting when deflected by such a field. It is shown that this restriction may be to a large extent eliminated by stabilizing the arc by means of the flow of the protective gas. This results in equalizing the plasma velocity field and increasing the total velocity of the cathode flow and thus in deforming the arc as a single whole, particularly in the upper (near-cathode) region of the column. Another method of stabilizing the arc is the employment of the so-called "directing wall". In this case, the arc discharge moving in a commercial-frequency transverse magnetic field is bounded by two graphite or cooled copper blocks (see Fig. 1 of the Enclosure). A tungsten electrode and the protective gas are passed through the space between the blocks. The flow rate of the argon is 7-8 liters/min, which precludes

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ACC NR: AP5025607

compression of the arc by the gas flow. The directional profile of the block is parabolic, thereby maximizing the displacement of the anode spot. The device stabilizes the flame so that the anode flow bounces from the walls and is directed counter to the cathode flow, thus displacing the anode spot. Orig. art. has: 11 figures.

ASSOCIATION: MVTU im. Baumana

SUBMITTED: 00 ENCL: 01 SUB CODE: IE, EM

NO REF SOV: 003 OTHER: 001

Card 2/3

L 3271-66

ACC NR: AP5025607

ENCLOSURE: 01

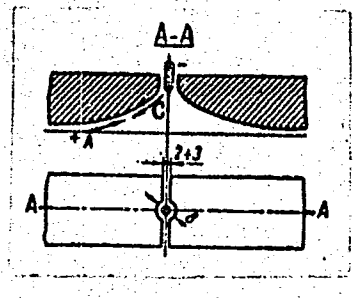

Fig. 1. Stabilization of arc by a "directing wall" in a transverse magnetic field: A and C are the anode and cathode flows

Card 3/3

KOVALEV, I.M., inzh.

Deflection of welding arcs in a transverse magnetic field. Svar. proizv. no.10:4-6 O '65. (MIRA 18:10)

1. Moskovskoye vyssheye tekhnicheskoye uchilishche im. Baumana.

KOVALEV, I.M., inzh.; AKULOV, A.I., doktor tekhn. nauk

Stability of a welding arc in a transverse magnetic field.
Svar. proizv. no.10:6-9 O '65. (MIRA 18:10)

1. Moskovskoye vysshoye tekhnicheskoye uchilishche im. Baumana.

L 35814-66 EWP(k)/EWT(m)/T/EWP(v)/EWP(t)/ETI IJP(c) JD/HM

ACC NR: AP6015248 (A) SOURCE CODE: UR/0125/66/000/005/0056/0057 33 32 8

AUTHOR: Kovalev, I. M.

ORG: Rostov-on-Don Institute of Agricultural Machine Building (Rostovskiy-na-Donu institut sel'khozmashinostroyeniya)

TITLE: Compressed-arc spot welding of joints 16

SOURCE: Avtomaticheskaya svarka, no. 5, 1966, 56-57

TOPIC TAGS: arc spot welding, arc welding, spot welding, steel, welding technology/St.3 steel

ABSTRACT: Experiments performed by the authors showed that the use of a high-speed jet of CO_2 during gas-electric welding makes it possible to increase the depth of fusion; the latter increases markedly with decreasing rate of motion of the arc, owing to both the attendant increase in the linear energy of the arc and the improvement in the conditions of interaction between the gas jet and the molten layer underneath the arc. Hence, the melting power of the compressed arc may be maximized when the welding rate is zero, i.e. during arc spot welding. This has the disadvantage of leading to a rapid increase in the extent of the molten layer underneath the arc, since the overall amount of the molten electrode metal and molten base metal increases proportionately in time. This, however, can be remedied by adjusting the pressure exerted by the gas jet on the weld pool. Fig. 1 presents the flow rate v_{CO_2}

Card 1/3 UDC: 621.791.8

L 35814-66

ACC NR: AP6015248

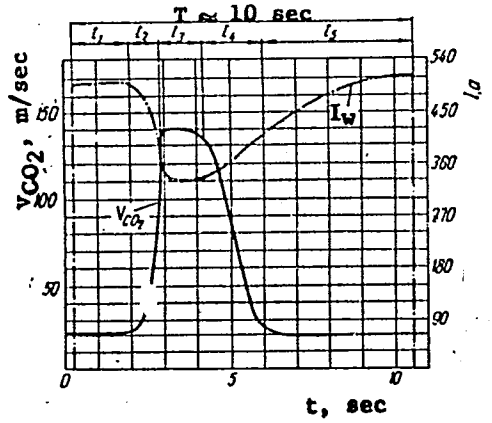

Fig. 1. Compressed-arc CO_2-shielded spot welding cycle for St.3 steel $\delta = 14 + 14$ mm (electrode diameter 1.6 mm)

of the gas as a function of the time of the full cycle of a single arc spot welding operation with respect to the welding of St.3 steel. This cycle may be divided into 5 basic periods. During the first period t_1 the arc is struck and the required minimum of molten metal is created underneath it. During the second period t_2 the gas is supplied at a fast rate (100-120 m/sec^2) and the arc is plunged into the metal so that the required depth of fusion is attained. During the third period t_3 the arc is

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ACC NR: AP6015248 O

held fast and the spot base is welded up. During the fourth period t_4 v_{CO_2} is reduced to its original level and the arc begins to weld up the hole. During the fifth period t_5 the welding of the spot is completed. Optimal welding regime (for St.3 steel δ = 14 + 14 mm): electrode diameter 1.6 mm, v_{CO_2} 130-150 m/sec, I_w = 480-520 a, U_w = 32-35 v, electrode reach 10-12 mm. Orig. art. has: 2 figures and 1 table.

SUB CODE: 11,13/ SUBM DATE: 20Dec65/ ORIG REF: 000

Card 3/3

KOVALEV, I.N. [deceased]; TRYAPITSYNA, L.N.

Bibliographic index of works completed at the station of the Astrakhan Preserve. Trudy Astr. zap. no.5:353-369 '61.
(MIRA 16:8)

(Bibliography--Astrakhan Preserve--Natural history)
(Astrakhan Preserve--Natural History--Bibliography)

KOVALEV, I.P.; PROKOPENKO, A.P.; TITOV, Ye.V.

Spectroscopic study of some unsaturated six-membered lactones.
Ukr. khim. zhur. 29 no.7:740-743 '63. (MIRA 16:8)

1. Khar'kovskiy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut.

(Lactones—Spectra)

KOVALEV, I.P.; TITOV, Ye.V.

Infrared absorption spectra of natural compounds. Part 1: Flavonoids. Absorption bands of carbonyl and hydroxyl groups. Zhur. ob. khim. 33 no.5:1670-1676 My '63. (MIRA 16:6)

1. Khar'kovskiy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut.
(Flavonoids)
(Carbonyl group—Absorption spectra)
(Hydroxyl group—Absorption spectra)

DAL', V.I.; ZMIYEVSKIY, P.K.; KOVALEV, I.P.

Heavy refining residues of Volgograd petroleums as raw materials for the retarded coking process. Izv. vys. ucheb. zav.; neft' i gaz 6 no.10:55-58 '63. (MIRA 17:3)

1. Dnepropetrovskiy khimiko-tekhnologicheskiy institut im. Dzerzhinskogo.

L 33271-66

ACC NR: AR6016193 SOURCE CODE: UR/0058/65/000/011/D025/D025

AUTHOR: Kovalev, I. P.; Titov, Ye. V. 39

TITLE: Infrared absorption spectra of natural derivatives of α and γ pyrone B

SOURCE: Ref. zh. Fizika, Abs. 11D191

REF SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 3, vyp. 1, 1964, 637-643

TOPIC TAGS: ir spectrum, absorption band, spectrum analysis, hydrogen bonding, chelate compound

ABSTRACT: The authors investigated the ir absorption spectra of 55 flavoncids, coumarins, and furocoumarins, and propose a classification of the frequencies in the 4000 - 650 cm^{-1}. It is shown that spectroscopic identification of the derivatives of α and γ pyrone by means of the frequencies and intensities of the absorption bands of the hydroxyl, carbonyl, and other groups is possible. The chelate hydrogen bond of the flavonoids, which plays an important role in the manifestation of their biological action, is investigated. Work is done on the preparation of a chart of ir spectra of the derivatives of α and γ pyrone (standardization of the measurement of the spectrum, development of type of documentation). [Translation of abstract]

SUB CODE: 20, 07

Card 1/1 dly

KOVALEV, I.P.; LITVINENKO, V.I.

Flavonoid glycosides. Part 1: Monoglycosides. Khim.prirod. soed. no.4:233-241 '65. (MIRA 19:1)

1. Khar'kovskiy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut. Submitted March 23, 1965.

KOVALEV, I.P.; TITOV, Yu.V.; CHERNOBAY, V.T.; KOMISSARENKO, N.F.

Infrared spectra of glucosides of the strophanthidin series.
Ukr.khim.zhur. 31 no.5:513-516 '65.

(MIRA 18:12)

1. Khar'kovskiy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut. Submitted Dec. 6, 1963.

KOVALEV, I.P., starshiy inzh.

Prerefining of petroleum. Neftianik 6 no.4:15-17 Ap '61.
(MIRA 14:8)

1. Stalingradskiy sektor Spetsial'nogo konstruktorskogo byuro po avtomatike v neftepererabotke i neftekhimii.
(Stalingrad--Petroleum--Refining)

KOVALEV, I.F., inzh.

Redesigning a pressure-vacuum distillation unit. Neftianik 6 no.9:16-17 S '61. (MIRA 14:10)

1. Stalingradskiy neftepererabatyvayushchiy zavod.
(Distillation apparatus)

Country : USSR
Category : Farm Animals. The Honeybee.
Abs. Jour : Referat. Zhur., No. 4, 1959, No. 16775
Author : Kovalev, I. S.
Institut. :
Title : My Experience in Substituting Queens.

Orig Pub. : Pchelovodstvo, 1958, No 6, 20-22

Abstract : Into a colony with a 2-years old queen a mature queen cell was placed at the time of intensive gathering [of honey] into the second entrance of the upper body of the hive or into the storage part, without removing the old queen. In 20 colonies out of 24 the change of the queens proceeded satisfactorily. It was observed that the queen accepts more readily strong colonies whose development has been completed. If the colony does not accept the

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Card: 2/2

VISHNEVSKIY, Nikolay Yevgen'yevich; GLUKHANOV, Nikolay Parmenovich; KOVALEV, Ivan Sidorovich; STOLYAROV, V.I., retsenzent; MARKIN, G.I., kandidat tekhnicheskikh nauk, redaktor; CHERNOUSOV, N.P., inzhener, redaktor; GOFMAN, Ye.K., redaktor izdatel'stva; SOKOLOVA, L.V., tekhnicheskiy redaktor

[High pressure apparatus with hermetically sealed electric motors] Apparatura vysokogo davleniia s ekranirovannym elektrodvigatelem. Moskva, Gos. nauchno-tekhn. izd-vo mashinostroit. lit-ry, 1956. 178 p. (MIRA 9:8)

(Electric motors) (Machinery industry)

KOVALEV, I.S.

Category : USSR / Radio Physics. Radiation of Radio Waves. Transmission Lines and Antennas I-5

Abs Jour : Ref Zhur - Fizika No 3, 1957, No 7287

Author : Kovalev, I.S.
Title : Calculation of Wave Attenuation in Rectangular Waveguides With the Aid of the Complex Electromagnetic Field Vector.

Orig Pub : Tr. Ryazansk. radiotekhn. in-ta, 1956, 1, 51-58.

Abstract : The calculations are carried out by directly solving Maxwell's equations with the aid of the complex electromagnetic field vector. In conclusion the author indicates certain inaccuracies that other investigators have overlooked in the derivation of a formula for the attenuation of the H_{10} wave in rectangular waveguides.

Card : 1/1

S/142/62/005/002/011/019
E200/E382

9,1400

AUTHOR: Kovalev, I.S.

TITLE: Theory of the asymmetric air-filled strip transmission line

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 2, 1962, 245 - 249

TEXT: The theory of an asymmetric air-filled strip transmission line is outlined. Taking the boundary fields into consideration formulae are derived for the transmitted power P, power loss per unit of the line Q, and the attenuation β. It is found by treating the strip line as an ideal condenser and using conformal mapping methods that:

$$P = \frac{C}{8w} \cdot \frac{E_o^2}{Z} \cdot d^2(r_B - r_A) \qquad (11)$$

where E_o is the homogeneous field in the cavity,

Card 1/4

Theory of ....

$Z = \sqrt{\mu/\varepsilon}$ is the wave impedance of free space,
b is the width of the strip,
d is the distance between the strip and the conducting plane,
r_A and r_B are the roots of the transcendental equation:

$$r - \ln r - 1 - \frac{b\pi}{2d} = 0 \qquad (10).$$

It is further found that:

$$Q = \frac{C}{4\pi^2} \cdot \frac{R_n}{Z^2} \cdot E_o^2 . d . \left[(r_B - r_A) + \ln \frac{e^{r_A} + 1}{e^{r_B} + 1} \right] \qquad (17)$$

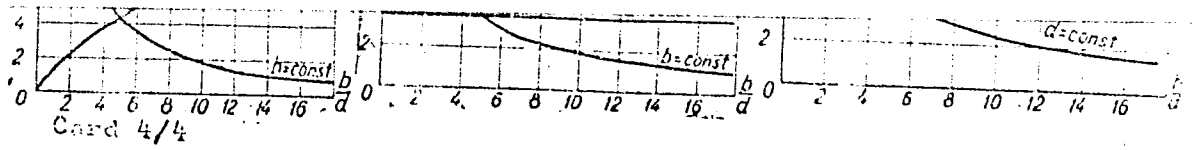
where $R_n = \sqrt{\omega\mu/8\pi\gamma}$ is the surface impedance;

Card 2/4

$$\beta = \frac{R_n}{Z} \cdot \frac{1}{d} \left[1 + \frac{\ln \frac{e^{r_A} + 1}{e^{r_B} + 1}}{r_B - r_A} \right] \qquad (18)$$

These formulae are represented by Fig. 4 (P/E^2 as a function of b/d), Fig. 5 (Q/E^2 as a function of b/d) and Fig. 6 (β as a function of b/d). A table of roots of Eq. (10) for the permissible range of b/d ratios is given. Experimental verification of the power-transmission formula has demonstrated an agreement within 7% of the theoretically computed value. There are 6 figures and 1 table.

Card 3/4



Card 4/4

KOVALEV, I.S.

Calculation of the capacitance of the characteristic impedance of a nonsymetrical strip line. Izv. vys. ucheb. zav.; radiotekh. 5 no.3:368-375 My-Je '62. (MIRA 15:9)

1. Rekomendovana kafedroy teoreticheskikh osnov elektrotekhniki Ryazanskogo radiotekhnicheskogo instituta.
(Condensers (Electricity))

4143

S/142/62/005/004/009/010
E192/E382

9.1400

AUTHOR: Kovalev, I.S.

TITLE: Determination of the capacitance and the characteristic impedance of a symmetrical strip line with an air-filler

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 4, 1962, 527 - 530

TEXT: An exact analytical determination of the capacitance of a strip line presents considerable difficulties since it depends on the solution of elliptical integrals of the first order. The capacitance of such a symmetrical line was therefore determined experimentally, the measurements being conducted at a frequency of 60 Mc/s by means of a Q-meter. It is found from the experimental data that the capacitance can be approximately described by the following formula:

$$C = 0.15\left(1 + \frac{b}{d}\right)\frac{nF}{cm} \qquad (2)$$

where b is the width of the central strip of the line and

Card 1/3

Determination of the ....

d is the spacing between the strip and the earthing plates. The formula is valid for $b/d > 0.6$. The impedance of the strip can be expressed by:

$$Z_o = 30/C \qquad (1) .$$

If Z_o is evaluated by using Eq. (2) for expressing C , the result is fairly accurate, except when the thickness Δ of the centre strip is a significant fraction of d . In the latter case, the capacitance can be expressed by:

$$C = 0.15\left(1+\frac{b}{d}\right)\left(\frac{1}{1-\frac{\Delta}{d}}\right)\frac{nF}{cm} \qquad \text{for } \frac{b}{d} < 2$$

$$C = 0.15\left[1+\frac{b}{d}\left(\frac{1}{1-\frac{\Delta}{d}}\right)\right]\frac{nF}{cm} \qquad \text{for } \frac{b}{d} > 2$$

Card 2/3

Card 3/3